The Impact of Borderline Personality Disorder Features on Self-Reported Invalidation and Learning Task Performance

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Abstract

Invalidation has been defined as the perception that one's thoughts, emotions, or behaviors are inappropriate, inaccurate, or misunderstood by others. Invalidating responses have been shown to increase emotional arousal (Shenk, 2007) and impair cognitive ability (Fruzzetti, 2005). Invalidation may be particularly problematic for individuals with Borderline Personality Disorder (BPD) and related features, due to increased emotional sensitivity and reactivity (Domes, Schulze, & Herpertz, 2009) and negative interpersonal biases (Barnow et al., 2009). We experimentally assessed the impact of validating and invalidating experiences on learning task performance. Undergraduate participants (N = 66) first completed the borderline features scale of the Personality Assessment Inventory (PAI-BOR; Morey, 1991) and a self-report measure of invalidation. They were then randomized to receive 4 minutes of either validating or invalidating feedback while recalling a time they were angry; finally, cognitive flexibility was assessed using a card-sorting task. We predicted that 1) Higher BPD features would predict greater self-reported invalidation, and 2) BPD features would moderate the relationship between feedback condition and learning task performance, such that higher BPD features would be associated with poorer performance. We found that as BPD features increased, invalidation also increased; however, this main effect was in the context of a significant interaction effect, such that highest self-reported invalidation occurred at high levels of BPD symptoms in the invalidation condition. Furthermore, higher BPD features were associated with committing a greater number of errors on the learning task when invalidated. Thus, invalidation may be particularly problematic in terms of learning for those with heightened BPD features; future research should examine the impact of invalidation within the context of psychotherapy, to inform practitioners and guide clinical practice.

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Interpersonal interactions are an important and complex component of daily life. The nature and quality of one's interactions with other people can impact nearly every domain of functioning. Just as some forms of communication are associated with benefits, and others are associated with harm, still others may serve less predictable functions, depending on the context in which they occur. Two such potentially-complex forms of communication, which have only recently begun to receive empirical attention, are *validation* and *invalidation*. Both are theorized to occur with some frequency during everyday life (Linehan, 1993), and a growing body of research and theory about the concepts of validation and invalidation speak to their potential impact on emotional and cognitive functioning.

Further, the presence of certain psychological disorders may uniquely impact the effect of validating and invalidating behaviors, particularly for disorders which are characterized by emotional dysregulation and/or interpersonal difficulties. Borderline Personality Disorder (BPD) is one such disorder. We will begin with a detailed description of what is meant by validation and invalidation, followed by a brief overview of the relevant BPD literature, particularly as it pertains to learning.

Validation

Validation involves communicating acceptance of some part of a thought, emotion, or action, emphasizing its reasonableness and appropriateness given the situation in which it occurred (Linehan, 1993). Validation can be as brief as a single comment or as lengthy as an entire conversation. The key to validating another is to reflect back the wisdom in the other person's view, no matter how small, without necessarily agreeing with it or condoning it (Linehan, 1993). Fruzzetti (1997) outlined seven levels of validating responses which overlap

heavily with those first outlined by Linehan (1997), that serve to identify the diverse array of potentially validating responses. Fruzzetti's seven levels include attentive listening, functionally responding, clarifying, recontextualizing, normalizing, radical genuineness, and reciprocal vulnerability.

Validation has been theorized to be psychologically beneficial for a variety of reasons. Theoretically, clinicians can utilize validating responses to enhance therapy and regulate clients' emotions in-session (Lynch, Chapman, Rosenthal, Kuo, & Linehan, 2006). First, validation can be used as a reinforcer of clinical progress, to encourage and reward appropriate self-disclosures and steps taken toward treatment goals. Second, validation can be utilized in conjunction with more direct, change-based behavioral strategies, to encourage the client to modify their thoughts and behaviors while feeling understood and supported. Because validation's central behavioral principle is reinforcement (Thorp, 2001), the supportive environment fostered by validating responses may preserve and increase the quality and frequency of interactions with the validating partner.

Invalidation

Invalidation can occur when a person's valid thoughts, emotions, behaviors, or actions are negated, ignored, or deemed to be inaccurate or inappropriate. Invalidation can be active, as in the case of passing judgment on someone or blaming them for their life situations, or passive, such as through unresponsiveness to self-disclosures or missing obvious opportunities to validate (Fruzzetti, 1997). Fruzzetti (1997) identified seven levels of invalidation that can occur in interpersonal interactions, including inattention, functional unresponsiveness/ missed opportunities, insisting, increasing negative valence, pathologizing, fragilizing, and indifference to vulnerability. Invalidation typically serves as a punisher of the behaviors preceding the

invalidating response (Thorp, 2001), and may negatively impact the quality of the relationship in which it occurs. Criticizing, ignoring, or insisting on a particular point of view may also be considered invalidating by one's interaction partner (Linehan, 1993).

Borderline Personality Disorder

BPD remains a challenge to clinicians and researchers alike, due to the complexities inherent in treating a syndrome characterized by chronic emotional instability, interpersonal conflict, and impulsive behaviors (Lynch, Trost, Salsman, & Linehan, 1997). As the most common personality disorder diagnosis across both inpatient and outpatient settings, BPD is estimated to affect 2-5% of the U.S. population (Widiger & Trull, 1993).

The existing literature on validation and invalidation is strongly tied to the etiology of Borderline Personality Disorder (BPD). Invalidating childhood environments, in which the child's emotions are punished, criticized, or ignored, are theorized to interact with biologically-determined deficits in emotion regulation to contribute to the emergence of BPD, via Linehan's biosocial model (1993). Three major heritable deficits in emotional regulation are theorized to be common to most individuals with BPD. First, evidence suggests that individuals with BPD are especially sensitive to emotion, with a tendency to respond emotionally to a wider range of experiences than non-disordered individuals (Linehan, 1993). Additionally, individuals with BPD tend to respond with stronger emotional reactions to stimuli (e.g., Yen, Zlotnik, & Costello, 2002), suggesting greater overall emotional reactivity. Third, individuals with BPD are theorized to experience emotional responses for a longer period of time than individuals without the disorder, taking longer to return to emotional "baseline" (Linehan, 1993).

In addition to greater emotional vulnerability and intensity, individuals with BPD also tend to have greater difficulty controlling their emotions once they occur (Yen et al., 2002). Yen

and colleagues reported that affective control (i.e., degree of ability or skill in regulating one's emotions) impacts the severity level of BPD features above and beyond the impact of the aforementioned heightened affective intensity. It may be the case that individuals high in BPD features are more emotionally dysregulated generally, as well as more emotionally impacted by experiences of invalidation once they occur. Such research lends support to the notion that BPD individuals may be particularly impacted by invalidating experiences, due to underlying emotional vulnerabilities and difficulties in processing and recovering from invalidating interactions.

Why Might Invalidation be a Problem for Learning?

High levels of emotional arousal, such as those arising from experiences of invalidation, have been shown to interfere with overall cognitive processing and information recall (Bock & Klinger, 1986; Ihssen, Heim, & Keil, 2007). In particular, high arousal has been demonstrated to negatively affect information processing and recall, particularly immediately after presentation of the information (Kleinsmith & Kaplan, 1963). Experiences of invalidation have been shown to increase emotional and physiological arousal (Woodberry et al., 2008) and delay participants' return to normal emotional and cognitive function (Fruzzetti et al., 2005).

Shenk (2007) investigated the effects of validation and invalidation on emotional arousal created via an experimental task. He found that participants in the validation group reported significantly lower levels of self-reported negative affect and had lower heart rates when compared with the invalidation group, suggesting lower overall physiological and psychological arousal following experiences of validation compared to experiences of invalidation. He also found that these effects persisted over time, with repeated validation continuing to lower emotional arousal and continued invalidation maintaining and even increasing emotional arousal

over time. Given the differential effects of validation and invalidation on arousal, validating and invalidating experiences may also differentially enhance learning or flexible thinking, which are considered to be processes downstream from arousal.

In a study of women with high BPD features with poor emotion regulation skills, invalidation during a frustrating anagram-solving task increased physiological arousal (Woodberry et al., 2008). While there was no difference in arousal level between groups prior to the manipulation, significant differences in self-reported emotional valence were observed; the BPD group reported less happiness and greater discomfort with their emotions when compared with the control group, even before the validating and invalidating comments were made.

In conclusion, there is reason to believe that individuals high in BPD features may be particularly susceptible to the negative emotional and cognitive effects of experienced invalidation. Because invalidation is understood to occur with some regularity in everyday life, and because it is possible that high BPD individuals feel invalidated more often than other people, we aim to understand the impact of such occurrences on cognitive processing ability- in particular, the ability to learn new information and skills. If individuals with higher BPD features experience greater invalidation in response to a wider array of interpersonal experiences, it may be the case that these same individuals are experiencing cognitive processing deficits for a substantial portion of their interpersonal interactions.

Study Aims

In the present study, we set out to experimentally manipulate participants' experience of validation or invalidation, then examine 1) the impact of invalidating experiences on their ability to successfully complete a complex learning task, 2) the impact of BPD features on self-reported

invalidation, and 3) the moderating impact of BPD features on learning task performance. To do so, we tested three hypotheses:

Hypothesis 1:

> Individuals in the invalidation condition will commit more errors on the card sorting task than the validation condition group.

Hypothesis 2:

> Higher BPD features will be associated with higher self-reported invalidation; i.e., participants who report more borderline features will also report higher levels of experienced invalidation.

Hypothesis 3:

> BPD symptom level will moderate the relationship between feedback condition (validation or invalidation) and learning task performance, such that as BPD symptoms increase, invalidation will result in even more errors on the learning task.

Method

Participants

Participants were recruited from a pool of undergraduate students enrolled in introductory psychology courses. Recruitment materials emphasized that participation in the study would involve completing learning tasks to better understand the relations between learning and emotion. The only inclusion criteria were that participants be at least 18 years of age and speak English fluently. There were no exclusion criteria. A total of 108 participants were recruited for a larger study. Of the recruited participants, nine participants were excluded due to English fluency difficulties (as judged by the experimenter before starting the data collection) and 33 participants were randomized to an arm of the study that is not included in this paper. Thus, 66

individuals participated in this study with 33 randomized to the validation arm and 33 randomized to the invalidation arm. Demographic data for participants are in Table 1.

Measures and Materials

Questionnaires.

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988).

The PANAS was designed to measure positive and negative affect. It consists of ten positive affect (PA) words (e.g., determined, excited) and ten negative affect (NA) words (e.g., hostile, guilty). Each participant rates the strength of each affective term on a scale from 1 (not at all) to 5 (extremely). We asked participants to rate how they were currently feeling at that moment. From these ratings, scores for positive and negative affect were calculated. The PANAS has been found to be stable, highly internally consistent, and the two factors are largely uncorrelated (Watson et al., 1988).

Personality Assessment Inventory – Borderline Personality Disorder Subscale (PAI-BOR; Morey, 1991) The PAI-BOR is a 24-item self-report scale used to assess features common to BPD, such as affective lability, relationship instability, feelings of emptiness, and dependence on others. This scale has been found to be a valid measure of BPD features, and individuals identified as high on BPD features according to this measure have been shown to have more severe impairments over the course of two years than individuals with lower levels of BPD features (Trull, 1997). The PAI-BOR has demonstrated good internal reliability ($\alpha = 0.84$; Trull, 1995). The internal reliability for the current sample was also high ($\alpha = .84$).

Self-Reported Validation and Invalidation Scale (SRVIS). We developed the SRVIS to assess self-reports of the severity of invalidating experiences. In a pilot study (Stigen & Cheavens, 2011), we generated and refined 10 items designed to reflect Fruzetti's (1997)

conceptualization of types of invalidating interpersonal experiences. Items included "Was the experimenter responsive to your emotions?" and "Was the experimenter interested in what you had to say?" Five of the items were written to reflect validating experiences and were reverse scored to create a total score. Participants responded to items using a 0 (Never) to 4 (Almost Always/Always) scale with higher scores reflecting higher levels of self-reported invalidation. Scores ranged from 0 to 34, suggesting variability in responses. Furthermore, the internal reliability of the scale was good ($\alpha = .83$).

Experimental Manipulation.

Participants were randomly assigned to receive either validating or invalidating feedback from the experimenter. The validation condition utilized a flexible validation script to ensure that all participants received a very similar set of validating responses, both in terms of total time being validated as well as the specific statements and questions being used. For the invalidation condition, a flexible invalidation script was utilized, with similarly structured invalidating responses (i.e. "That's a reasonable response" is instead "That's an atypical response"). Each participant received either validating or invalidating for approximately four minutes.

Learning Stimulus.

Modified Emotional Wisconsin Card Sort Test. The Wisconsin Card Sort Test (Berg, 1948) is a reliable, objective measure of set-shifting ability, cognitive flexibility, and attentional control. Card sort tests have been shown to have adequate ecological validity as a proxy for the forms of cognitive flexibility required for typical everyday tasks (Kibby, Schmitter-Edgecombe, & Long, 2000). In our modified, electronically-administered version of the Wisconsin Card Sorting Test, we incorporated emotion words instead of shapes. In a traditional card sort, shapes such as triangles or circles would be utilized, but our modified version includes three different

emotion words (one neutral, one negative, and one positive word; *calm*, *rage*, and *love* were chosen for this experiment) instead of three different shapes, We wished to assess the possibility that the valence of the word would impact learning task performance as a separate analysis within the larger experiment protocol.

To complete the card sort task, participants first learned a sorting rule by matching a "target" card to one of three different "category" cards which differed from the target card in terms of color, font, or number of words (i.e. 'Calm Calm Calm'). This rule changed upon completion of each trial (N = 10 correct sorts) without warning; participants had to switch to the newly-correct rule to progress through the card sorting test. Results from the card sort were coded into a variety of outcome variables, including total responses, total errors, percent "conceptual responding," and failure to maintain set. We will present total responses and total errors made during completion of the task as representative outcome variables for the card sorting task.

Procedure

This study was approved by the institutional review board at The Ohio State University. Participants were told that this was a study of emotion and learning and were not informed a priori of the randomization or invalidation/validation manipulation. A random numbers generator was used to randomize participants and randomization occurred before the participant arrived to the study session. When participants arrived for the study, the procedures were explained and informed consent was collected. There was no drop-out or refusal of participation.

Participants first completed a battery of questionnaires, including a demographics form, the PANAS, and the PAI-BOR. After completing the questionnaires, participants were asked to participate in the recounting of a time in their lives when they "felt intense anger." Participants

were asked to think about this time for one minute, with specific directions to focus on the details of the event and how they felt. Participants were then instructed to write about the event for an additional three minutes. At the conclusion of three minutes of writing, the experimenter said, "Now I am going to ask you about what you just completed. Can you tell me what you wrote about?" The experimenter and the participant discussed the event associated with intense anger for an additional four minutes.

During this time, the experimenter responded using a script to either validate or invalidate the experience of anger. For participants randomized to the validation condition, the experimenter started with the phrase "That seems like a pretty good reason to get upset" and then continued to follow up with validating comments (e.g., that makes sense, I think anyone would have felt that way, etc.) selected from a flexible script. For participants randomized to the invalidation condition, the experimenter started with the phrase "Really? That doesn't seem like something to get that upset about" and then continued to follow up with invalidating comments (e.g., I'm surprised you felt that way, that doesn't seem that bad) selected from a flexible script.

Following the discussion of the intense anger event, participants completed the ECST for up to 15 minutes. If participants completed the ECST (8 sets of 10 correct cards) before 15 minutes had lapsed, they then worked on a distracter task (a version of the Ruff 2 & 7s task selective attention task) for the remainder of the 15 minutes. 88.9% of participants were able to complete the ECST within the allotted 15 minutes. Following completion of the learning task, participants again completed the PANAS.

Results

Sample Characteristics and Manipulation Checks

As can be seen in Table 1, there were no demographic or other baseline differences between the validation and invalidation groups. In order to check the validity of the manipulation, we compared the groups on SRVIS scores. Results suggested that the manipulation was successful; individuals in the invalidation condition reported significantly more invalidation (M = 14.31, SD = 7.60) than those in the validation condition (M = 3.03, SD = 3.17), $F(1, 65) = 61.96$, $p < .001$.

Completion of Card Sort Task.

Of the 66 participants, 59 (79%) completed the ECST within the allotted 15 minutes. To complete the learning task, participants were required to progress successfully through eight sets, each comprised of 10 consecutive correct responses. Therefore, the minimum number of responses required to complete the card sorting test was 80, with lower numbers indicating better performance. Total responses for the current sample ranged from 84 to 279. We present the total number of responses required to complete the task (*total responses*), as well as total errors committed while completing the card sorting test (*total errors*) as overall indicators of learning task performance for this sample. The distributions for both total responses and total errors had significant kurtosis, which were first corrected with a log10 transformation in each case. The log10 transformed values were used for analysis, but the non-transformed values are presented here for ease of interpretation.

Effects of Feedback Condition on Learning Task Performance

In Hypothesis 1, we hypothesized that individuals in the invalidation condition would require a higher number of responses to successfully complete the learning task, and commit

significantly more errors while doing so than those in the validation condition. We found no significant difference in number of total responses between the invalidation (M = 121.22, SD = 40.56) and validation (M = 122.28, SD = 45.61) conditions (t(63) = .02, p =.99). Similarly, we found no difference between invalidated and validated participants in terms of total number of errors committed, $t(63) = .01$, $p = .99$.

Impact of BPD Features on Self-Reported Invalidation

Testing hypothesis 2, that individuals with higher BPD features would perceive more invalidation, we found a significant main effect for BPD symptom level on total SRVIS score ($F(1,62) = 9.23$, $p = .004$). See Figure 1 for an illustration of this effect. We then conducted a regression analysis that included condition and BPD features in the first step and the interaction of these variables in the second step. The first step of the model was significant, adj. $R^2 = .55$, $F(2, 63) = 40.66$, $p < .001$ with both condition ($\beta = .72$, $p < .001$) and BPD features ($\beta = .27$, $p < .01$) predicting self-reported invalidation. Adding the interaction term accounted for an additional 6.5% of the variance in self-reported invalidation (adj. $R^2 = .61$, $F(3, 62) = 35.02$, $p < .001$). In this model, the interaction term significantly predicted self-reported invalidation ($\beta = .80$, $p < .001$) but neither condition nor BPD features remained significant. These results suggest that, for individuals in the invalidation condition, higher BPD features are associated with especially high levels of self-reported invalidation (see Figure 1).

Effects of BPD Features on Learning Task Performance

Total Responses.

Regarding Hypothesis 3, that BPD features would moderate the impact of feedback condition on total responses, we conducted a regression analysis with two steps, to examine the effects of BPD symptoms and the interaction effect of BPD features and feedback condition.

The regression model including the main effects of feedback condition and BPD features was not significant, adj. R^2 = -.03, F (2, 62) = .03, p = .97. However, when the interaction term was included in the second step of the model, the overall model was significant, adj. R^2 = .09, F (3, 61) = 3.05, p = .04. Furthermore, feedback condition (β = -.90, p < .01), BPD features (β = -.68, p < .01), and the interaction term (β = 1.14, < .01) all contributed significantly to the prediction of total responses on the task. This interaction suggests that BPD features moderate the impact of feedback condition on total responses, such that for individuals with higher BPD features, total responses increased in the invalidation condition, whereas for those with lower BPD features, total responses decreased in the invalidation condition. We anticipated finding that higher BPD features would be associated with a higher number of total responses in the invalidation condition, but the finding that lower BPD features were associated with a lower number of total number of responses was somewhat unexpected.

Total Errors.

When including BPD features and feedback condition in a regression analysis to predict total errors committed during the task, the model was not significant, adj. R^2 = -.03, F (2, 62) = .09, p = .92. Although the overall model was not significant when the interaction term was included, adj. R^2 = .04, F(3, 61) = 1.90, p = .44, the unique contribution of the interaction effect was significant, ΔR^2 = .08, ΔF(1, 61) = 5.5, p = .02. Additionally, feedback condition (β = -.72, p = .03), BPD features (β = -.57, p = .03), and the interaction term (β = .91, p = .02) all contributed significantly to the prediction of total errors in the second step.

Discussion

Primary Results and Clinical Implications

We found that higher BPD features were associated with greater self-report of invalidation following the invalidation manipulation, and also that invalidation and BPD features interacted to predict an especially high rate of errors on the card sorting task. The results from this study provide some support for the theory that BPD features contribute to a greater severity of impact for invalidation on learning ability.

We also found evidence that BPD features moderate the relationship between feedback condition (validation or invalidation) and learning task performance, such that high BPD individuals required a higher number of responses to complete the learning task when invalidated, whereas low BPD features were associated with a decrease in the total number of responses required to complete the task. Our finding that high BPD individuals who were invalidated performed particularly poorly on the learning task supported our hypothesis and illustrated the importance of BPD symptom level in determining one's level of invalidating experiences, which may in turn influence cognitive functioning. We theorize that the decrease in total responses for participants with low BPD features may be driven in part by an increase in emotional arousal for these individuals, due to another person indicating their understanding and the legitimacy of anger-inducing situations (e.g. "I'd be angry too! Anybody would be angry in that situation"), or by feeling less motivated to do well on the learning task. Clearly, additional research in this area will be necessary to clarify these interactions.

Future Directions

Our next step in this line of research will be to test the real-world impact of validation and invalidation using a clinical sample. We plan to track therapy clients as they progress

through treatment, assessing affect, symptom severity, treatment participation, and the therapeutic alliance across multiple time points, to see what impact self-reported experiences of validation and invalidation may have on treatment outcomes.

We also plan to apply this research proposal once again using a different set of learning tasks that are closer proxies for the types of learning typically occurring in treatment. For example, we may test invalidation's impact on the completion of problem-solving vignettes, the Means-Ends Problem-Solving Task (MEPS; Platt & Spivack, 1975), or other solution generation-type tasks. Completing additional tests of this nature will allow us to conclude with more certainty whether or not invalidation appears to impact learning task performance, and allow us to clarify the moderating impact of BPD features on this relationship across multiple tasks.

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Table 1

Demographic and relevant baseline characteristics of the sample

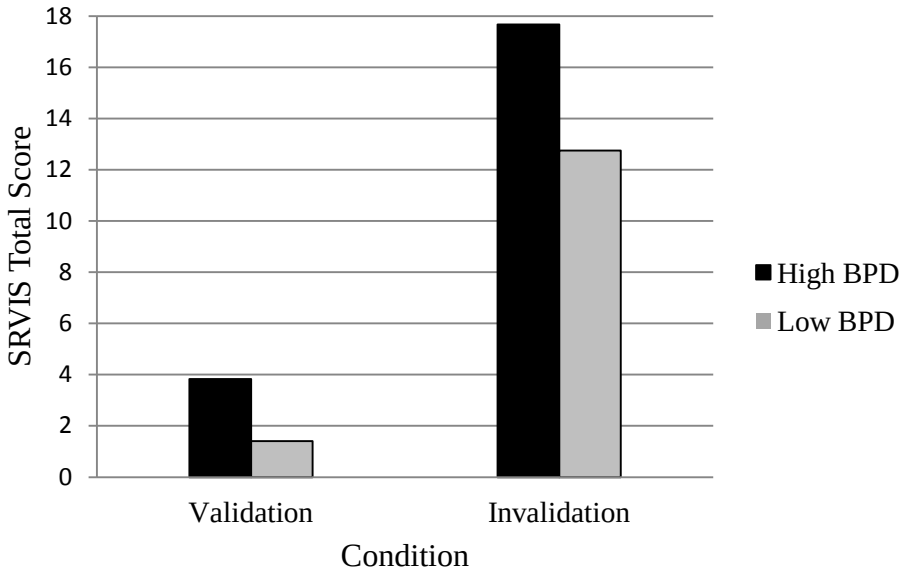
	Total Sample	Validation	Invalidation	*t* or χ^{2a}	*E*ffect size *d*
Age					
M (*SD*)	20.12 (5.4)	19.00 (.98)	21.21 (7.42)	-1.67	-.41
Gender					
% female	45.5	51.5	39.4	.27	N/A
BPD Sx					
M (*SD*)	24.39 (10.31)	24.97 (11.49)	23.82 (9.11)	0.45	.11
Pre-PA					
M (*SD*)	27.71 (8.09)	27.21 (8.79)	28.21 (7.43)	-0.50	-.12
Pre-NA					
M (*SD*)	14.59 (5.10)	14.73 (4.35)	14.45 (5.82)	0.22	.05

Note. All tests were non-significant (all *p*s > .05). BPD Sx = Borderline Personality Disorders features as assessed by the PAI-BOR. Pre-PA = PANAS PA score before manipulation. Pre-NA = PANAS NA score before manipulation.

[a] Chi square value provided for gender comparison.

Figure 1

BPD Features Predict Higher Self-Reported Invalidation



Note. SRVIS: Self-Reported Validation & Invalidation Scale; BPD: Borderline Personality Disorder